



PhD position on Holographic Video Coding

Research topic

Since the invention of holography in 1948, researchers are attempting to realize realistic 3D projections. Recent developments in photonics, microelectronics and computer engineering offer the prospect that this will soon be feasible. Holographic television with acceptable visual quality will be achievable within the next decade. But to generate and process these 3D images we require massive supercomputers given current technologies. Moreover, distributing the associated huge data volumes over a network is not an evident problem to solve.

To alleviate these bottlenecks, the ERC Consolidator Grant 'Sparse Signal Coding for Interference-based Imaging Modalities (INTERFERE)' obtained by Prof. Peter Schelkens pursues suitable sparse data representations for holographic signals. Moreover, holographic coding architectures are designed that address the aforementioned bandwidth issues. Additionally, improved models of the human visual system are being developed that allow to minimize the impact of reconstruction errors during the visualization of the holographic content.

Research in the context of this PhD position will be particularly targeted towards sparse signal coding strategies for dynamic holographic signals, i.e. holographic video.

This project will not only have a significant impact on the further developments in holographic television, but also seeding new applications in fields such as of medical imaging, biophotonics, life sciences and telecommunications.

Besides the scientific challenge, the position provides a great opportunity to work closely together with experienced researchers in the field of multidimensional signal processing and photonics.

Keywords

Holographic video coding, signal modeling, digital holography, photonics.

Work environment

The **Electronics and Informatics department (ETRO)** belongs to the Faculty of Engineering Sciences at the *Vrije Universiteit Brussel (VUB)* and is part of the strategic research center imec. ETRO has built a large international collaboration network with a wide variety of industrial partners, academic institutions and R&D centres, and participates in a numerous fundamental, strategic and applied research projects in these domains.



ETRO performs research on the representation, transmission, analysis, quality assessment and visualization of multidimensional signals.

In data compression, ETRO has been active for more than 20 years in various research areas, including predictive and transform-based coding of images, video and meshes, near-lossless compression, multiple description coding, joint source and channel coding, error concealment, distributed video coding, visual quality assessment, and optimized media transmission over networks.

Prerequisites & other requirements

You have a master degree in electrical engineering, computer science, mathematics or physics and you are attracted by the challenges in the domain of digital holography and associated multidimensional signal processing. You have good programming skills (C/C++) and/or profound MATLAB experience. You have a thorough background in mathematics and digital signal processing and preferably a basic knowledge of photonics. You have good oral and written communication skills. Fluency in English is a must, given the international character of the department.

Interested? Send your application to:

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Websites

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ERC INTERFERE: www.erc-interfere.eu

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